# BULK SPECIFIC GRAVITY OF COMPACTED BITUMINOUS MIXTURES USING AUTOMATIC VACUUM SEALING METHOD ASTM D 6752

## APPARATUS

- [ ] Balance, class GP 2, in accordance with ASTM D 4753, readable to 0.1 g
- [ ] Water Bath, with minimum dimensions of 24 in. long x 18 in. wide x 18 in. deep, or a large cylindrical container, equipped with an overflow outlet
- [ ] Cushioned Holder, having no sharp edges
- [ ] Vacuum Chamber
  - [ ] 1.25 hp pump capable of evacuating a sealed and enclosed chamber to 29.5 in Hg vacuum in less than 60 s
  - [ ] Chamber large enough to seal samples of 6 in wide by 14 in. long by 6 in. thick
  - [ ] Automatically seals plastic bag and exhausts air back to chamber in controlled manner to ensure proper conformance of plastic to specimen
  - [ ] Air exhaust system calibrated to bring chamber to atmospheric pressure in 80 to 120 s after completion of vacuum operation
  - [ ] Latch to control chamber door opening
- [ ] Vacuum Measurement Gage, independent of vacuum sealing device, capable of reading to 29.8 in. Hg of vacuum
- [ ] Plastic Bags
  - [ ] Small bag, minimum opening of 9.25 in. and maximum opening of 10.25 in.
  - [ ] Large bag, minimum opening of 14.75 in. and maximum opening of 15.5 in.
  - [ ] Will not adhere to asphalt film
  - [ ] Puncture resistant
  - [ ] Will withstand sample temperatures of up to 158 ºF
  - [ ] Impermeable to water
  - [ ] Contains no air channels for evacuation of air from bag
  - [ ] Minimum thickness of 0.004 in. and maximum thickness of 0.006 in.
- [ ] Specimen Sliding Plate
- [ ] Bag Cutting Knife or Scissors
- [ ] Granite Standard Cylinder
  - [ ] 6 in. diameter by 3 in.
  - [ ] Water absorption of 0.20 to 0.80% by weight

## SPECIMENS

[ ] Diameter of cylindrically molded or cored specimens, or length of sides of sawed specimens, at least four times the maximum size of aggregate
[ ] Thickness of specimens at least one and one half times maximum size of the aggregate
[ ] Specimens not distorted or cracked
[ ] Specimens free of foreign materials, such as seal coat, tack coat, foundation material, soil, paper, or foil.

## PROCEDURE -- WEIGHT OF UNSEALED SPECIMEN

Laboratory Prepared Specimen

[ ] Weight of specimen determined after it has cooled to room temperature

Cores and Specimens Containing Moisture

[ ] Specimen dried to constant weight and weight determined

Note: Constant weight is defined as less than 0.05% change in weight between consecutive 15 minute drying intervals.

## PROCEDURE -- WEIGHT OF SEALED SPECIMEN

[ ] Appropriate size bag selected.
  [ ] For all 4 in. diameter samples, and samples with 6 in. diameter and less than 2 in. thickness, smaller bag used
  [ ] For 6 in diameter samples with greater than 2 in. thickness, larger bag used
  [ ] For samples weighing more than 5500 g or abnormally shaped samples, manufacturer's recommendation for appropriate bag size and configuration used
[ ] Bag placed inside vacuum chamber on top of specimen sliding plate
[ ] Bag gently opened and specimen placed in the bag on top of specimen sliding plate without puncturing the bag
[ ] Vacuum chamber allowed to remove air from chamber and bag. (Vacuum chamber automatically seals the bag once the air is removed)
[ ] Air exhausted into chamber until chamber door opens indicating atmospheric pressure within chamber
[ ] Sealed specimen removed from vacuum chamber and handled with extreme care to prevent puncturing the bag
[ ] Weight of sealed specimen in air determined
[ ] Weight of sealed specimen in a water bath at 77 ± 1.8°F determined
[ ] Correction applied if water temperature is not at 77 ± 1.8°F

[ ] Duration of test from initiating the vacuum extraction to weighing the sealed specimen in water does not exceed 5 minutes

[ ] Specimen removed from bag and weighed

[ ] Weight of dry specimen in air is subtracted from weight of specimen. This weight is considered the amount of water that is absorbed.

[ ] Percent water absorbed by specimen is equal to or less than 2 percent when calculated as follows:

$$\text{Absorption, percent} = \frac{A_1 - A}{A} \text{ x } 100$$

where:
A = weight of dry specimen in air, g
$A_1$ = weight of specimen removed from bag after weighing in water, g

[ ] Weight of sealed specimen in water determined by subtracting the weight of absorbed water

[ ] Bulk Specific Gravity of sealed specimen calculated correctly to three decimal places (0.000) as follows:

Water at 77 ± 1.8°F

$$\text{Bulk Specific Gravity} = \frac{A}{B - E - \frac{B - A}{F_T}}$$

where:
A = weight of dry specimen in air, g
B = weight of dry, sealed specimen, g
E = weight of sealed specimen in water, g
$F_T$ = apparent specific gravity of plastic sealing material at 77°F, provided by manufacturer

NA - Not Applicable
X - Requires Corrective Action
√ - Satisfactory

_____
Acceptance Technician

_____ _____
INDOT Date

Comments _____